

## CLAIMS:

1. A Stirling engine comprising:
  - a displacer unit having displacer cylinders,  
displacers slidably arranged in the chambers of said  
5 displacer cylinders, expansion chambers and contraction  
chambers into which, and from which, an operation gas  
flows with the operation of said displacers; and  
a power piston unit having a power cylinder with  
an operation chamber that communicates with either said  
10 expansion chamber or said contraction chamber of said  
displacer unit, and a power piston slidably arranged in  
said power cylinder;  
wherein said displacer cylinders of said displacer  
unit are equipped with a heating wall surrounding a heat  
15 source and cooling walls forming a plurality of cylinder  
chambers surrounding said heating wall; and  
said displacers of said displacer unit are slidably  
arranged in said plurality of cylinder chambers in the  
directions to approach said heat source and to separate  
20 away from said heat source.
2. A Stirling engine according to claim 1, wherein said  
heating wall of said displacer cylinders forms a flow  
passage through which said heat source flows.
- 25 3. A Stirling engine according to claim 2, wherein the  
flow passage formed by said heating wall is of a  
cylindrical shape.
- 30 4. A Stirling engine according to claim 1, wherein a  
plurality of fins are provided in the axial direction on  
the inner peripheral surface of said cylindrical heating  
wall constituting said displacer cylinders.

5. A Stirling engine according to claim 4, wherein said fins are formed in a spiral shape.

6. A Stirling engine according to claim 1, wherein a  
5 core member is arranged in the central portion of said flow passage formed by said cylindrical heating wall that constitutes said displacer cylinders over nearly the full length of said flow passage.

10 7. A Stirling engine according to claim 1, wherein:  
said displacer unit comprises a pair of displacer cylinders arranged facing each other, and a pair of displacers slidably arranged in said pair of displacer cylinders;

15 said power piston unit comprises a power cylinder that communicates with either said expansion chamber or said contraction chamber of the pair of displacers, and a power piston that is slidably arranged in said power cylinder and divides it into a first operation chamber  
20 and a second operation chamber; and

said first operation chamber of said power piston unit is communicated with either said expansion chamber or said contraction chamber of said displacer unit through a first communication passage, and said second operation  
25 chamber of said power piston unit is communicated with said other expansion chamber or said contraction chamber of said displacer unit through a second communication passage.